

What is claimed is:

1. A method of processing a semiconductor wafer having a plurality of epitaxial layers, including a P-side cladding layer adjacent to a waveguide layer, so as to create
5 a distributed Bragg reflecting (DBR) grating in a defined window area without creating a distributed feedback (DFB) grating over the remainder of the wafer, comprising the steps of:
 - depositing a protective layer over said wafer;
 - removing said protective layer over a portion of said cladding layer to define a
10 window in an area of said wafer having negligible optical gain;
 - applying a photoresist over said wafer including said window area;
 - exposing said entire photoresist to interfering laser beams to create a grating pattern in said photoresist;
 - transferring said grating pattern into said cladding layer at said window area;
15 and
 - removing the remainder of said protective coating prior to depositing additional layers of said wafer
2. The method of claim 1 wherein said protective layer is selected from the group
20 consisting of SiO₂, Si₃N₄ and a metal.
3. The method of claim 1 wherein said photoresist is removed prior to transferring said grating pattern into said cladding layer.
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4. The method of claim 3 wherein a photoresist is exposed to said interfering laser holography beams provided from an argon laser.
5. The method of claim 4 wherein argon laser is operated at a wavelength of 458 nm.
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6. The method of claim 5 wherein after said photoresist is removed using an etchant selected from the group consisting of SF₆, CCl₂F₂, CCIF₃ and CF₄.

7. The method of claim 6 wherein after said photoresist is removed, a wet etchant
5 selected from the group consisting of SiCl₄ or BCl₃ is used to transfer said pattern into
said cladding layer.

8. The method of claim 1 wherein said protective layer has a refractive index -
different than the refractive index of said photoresist to cancel said interfering laser
10 beams over said protective layer.

9. The method of claim 1 wherein said additional layers include gain layers
beyond said window area.

15 10. The method of claim 1 wherein said additional layers include non-gain layers
over said window area.